

ABSTRACT OF THE DISCLOSURE

A method of masking and etching a semiconductor substrate includes forming a layer to be etched over a semiconductor substrate. An imaging layer is formed over the layer to be etched. Selected regions of the imaging layer are removed to leave a pattern of openings extending only partially into the imaging layer. After the removing, the layer to be etched is etched using the imaging layer as an etch mask. In one implementation, an ion implant lithography method of processing a semiconductor includes forming a layer to be etched over a semiconductor substrate. An imaging layer of a selected thickness is formed over the layer to be etched. Selected regions of the imaging layer are ion implanted to change solvent solubility of implanted regions versus non-implanted regions of the imaging layer, with the selected regions not extending entirely through the imaging layer thickness. The ion implanted regions of the imaging layer are removed to leave a pattern of openings extending only partially into the imaging layer. After the removing, the layer to be etched is etched using the imaging layer as an etch mask.